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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/360,184	12/20/1994	DONALD B. APPLEBY	4233C3	9348

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EXAMINER

WHITE, EVERETT NMN

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 11/05/2003

34

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/360,184

Applicant(s)

APPLEBY ET AL.

Examiner

EVERETT WHITE

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,8,9,13-15,23,27,28,30,43-45,48,51,54,55 and 62-118 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,8,9,13-15,23,27,28,30,43-45,48,51,54,55 and 62-118 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. The preliminary amendment and request for interference filed April 19, 1999 has been received, entered and carefully considered. The preliminary amendment affects the instant application accordingly:

- (A) Claims 2-4, 7, 10-12, 16-22, 24-26, 29, 31-42, 46, 47, 49, 50, 52, 53 and 56-61 have been canceled.
- (B) New Claims 79-118 have been added.
- (C) Claims 1, 13, 23, 30, 43 and 51 have been amended.
- (D) Claims 63-118 have been requested to be subjected to an Interference under C.F.R. §1.607.

2. Claims 1, 5, 8, 9, 13-15, 23, 27, 28, 30, 43-45, 48, 51, 54, 55 and 62-118 are pending in the case.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1, 5, 6, 8, 9, 13-15, 23, 27, 28, 30, 43-45, 48, 51, 54, 55 and 62 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Willemse (US Patent No. 4,973,682, already of record) or Volpenhein (US Patent No. 4,517,360, already of record) in view of Willemse (EPO 349059, already of record), Balint et al (US Patent No. 3,689,461, already of record), Balint et al (US Patent No. 3,679,368, already of record), Setzler (US Patent No. 3,567,369, already of record) or Mansour (US Patent Nos. 4,449,828, already of record).

Applicants claim a continuous process for preparing highly esterified polyol fatty acid polyester by interesterifying polyol containing more than four esterifiable hydroxy groups and fatty acid ester of an easily removable alcohol in a heterogeneous reaction mixture wherein (a) a catalyst is used in the reaction mixture at an initial level of from about 0.01 to about 0.5 mole of catalyst per mole of polyol; (b) a soap emulsifier is used in the initial stage of the process at a level of from about 0.001 to about 0.6 mole of soap per mole of polyol; (c) the molar ratio of total ester reactant to each esterifiable hydroxy group of the polyol in the reaction mixture ranges from about 0.9:1 to about 1.2:1; (d) the temperature in the initial stage of the process ranges from about 130°C to about 140°C, and in the final stages of the process ranges from about 80°C to about 120°C; and (e) easily removable alcohol is removed from the reaction mixture as the interesterifying reaction proceeds; wherein the initial stage of the interesterifying reaction is carried out in a continuous manner under conditions of backmixing suitable for maintaining within said reaction mixture a level of lower partial fatty acid esters of said polyol that is sufficient to emulsify said reaction mixture. Additional limitations in the dependent claims include the initial catalyst level being from about 0.01 to 0.1 mole of catalyst per mole of polyol or from about 0.02 to about 0.05 mole of catalyst per mole of polyol; the initial level of soap emulsifier being from about 0.2 to about 0.4 mole per

mole of polyol; the soap emulsifier being potassium soap of hydrogenated fatty acid containing from about 10 to about 22 carbon atoms; the molar ratio of the total ester reactant to the esterifiable hydroxyl group being from about 1:1 to about 1.2:1; the initial stage of the interesterifying reaction being carried out under conditions of backmixing until the average degree of esterification of the polyol is from about 20% to about 70% to provide sufficient lower partial polyol polyester to aid in solubilization of the polyol or under conditions of backmixing until the average degree of esterification of the polyol is from about 35% to about 60%; the process wherein the temperature in the initial stage is from about 132°C to about 135°C and the temperature in the subsequent stages is from about 100°C to about 120°C; the process wherein the final degree of esterification of the polyol reaches at least about 70% or at least 95%; the process wherein the final stages of the reaction are carried out under plug-flow conditions, after the degree of esterification of the polyol has reached at least about 50%; the process being carried out in a series of at least two reaction vessels; or three to about eight reaction vessels;

The Willemse Patent discloses a process for the synthesis of polyol fatty acid polyesters comprising a two-stage transesterification of polyol to polyester. Willemse discloses a process wherein a substantially solvent-free complete reaction mixture of a polyol, optionally in admixture with fatty acid oligoesters thereof, fatty acid lower-alkylester, a transesterification catalyst, and optionally an emulsifier, is caused to react under transesterification conditions of elevated temperature and reduced pressure, said pressure being controlled such that in an initial stage (1) said polyol is esterified to a degree of conversion within the range of 10 to 50% substantially without leaving non-participating polyol, and in a subsequent final stage (2) the reaction is caused to proceed to a degree of conversion of at least 70%. The Willemse Patent further discloses a molar ratio of fatty acid lower-alkylester:sucrose within the range of from 10:1 to 20:1 (see column 4, lines 39-41) and a molar ratio of catalyst:polyol from 0.05:1 to 1:1 (see column 4, lines 54-56). Willemse also discloses the use of alkali metal soaps having 6-12 carbon atoms (see column 4, line 67 to column 5, line 8). Willemse discloses that both stages of the transesterification reaction can be carried out at a similar temperature, which normally lies within the range of from 100° to 180°C (see

column 3, lines 50-52). In view of the difference in pressure regime during the initial and final stage of the reaction, Willemse discloses that it may be of advantage to use a reaction system comprising two separate reaction vessels each equipped with pressure control means optimized to the specific reduced pressure regime needed (see column 3, line 62-67). The process by Willemse also involves removal of the lower-alkyl alcohol from the reaction mixture during the esterification reaction. Willemse also suggests that the process can be carried out in a continuous or semi-continuous operation (see column 5, lines 64-68).

Volpenhein discloses a transesterification process for synthesizing polyol fatty acid polyesters comprising the steps (1) heating a mixture of (a) a polyol selected from the group consisting of monosaccharides, disaccharides and sugar alcohols, (b) a fatty acid ester selected from the group consisting of methyl esters, 2-methoxy ethyl esters, benzyl esters and mixtures thereof, (c) an alkali metal fatty acid soap, and (d) a basic catalyst, to a temperature of from about 110° C to about 180° C at a pressure of from about 0.1 mm to about 760 mm of mercury to form a homogenous melt; and (2) subsequently adding to the reaction product of step (1) excess fatty acid ester selected from the group consisting of methyl esters, 2-methoxy ethyl esters, benzyl esters and mixtures thereof (see column 2, lines 40-60). Volpenhein discloses that the heterogeneous mixture used to carry out the process of step 1 generally comprises from about 10% to about 50%, preferably from about 15% to about 30%, by weight of the polyol; from about 40% to about 80%, preferably from about 55% to about 75%, by weight of the fatty acid esters; from about 1% to about 30%, preferably from about 5% to about 20%, by weight of the alkali metal fatty acid soap; and from about 0.05% to about 5%, preferably from about 0.1% to about 0.5%, by weight of the basic catalyst component (see column 5, lines 3-12). The process disclosed by Volpenhein is within the scope of the process set forth in the instant claims. Volpenhein teaches heating the reaction mixture in the initial stages to temperatures ranging from about 110° C to about 180° C (see column 5, lines 33-35), and teaches heating this reaction mixture in the final stages to temperatures of from about 120° C to about 160° C (see column 5, lines 53-57). The temperature range of Volpenhein's initial stage covers the initial stage

temperature range claimed by the Applicants and the final stage temperature of 120° C as disclosed in the Volpenhein reference is within the final stage temperature ranged claimed by the Applicants which is a maximum of 120° C.

The instant claims differ from the Willemse and Volpenhein patents by claiming that the process is carried out under conditions of backmixing suitable for maintaining within said reaction mixture a level of lower partial fatty acid esters of said polyol that is sufficient to emulsify said reaction mixture and indicating that the alcohol is removed from the reaction mixture as the interesterifying reaction proceeds.

Willemse (EPO) discloses a process for the synthesis of polyol fatty acid polyesters, in which a polyol and/or a fatty acid oligoester thereof, is esterified by reaction with fatty acid lower alkylester under substantially solvent free conditions at elevated temperature in the presence of a transesterification catalyst and, optionally an emulsifier, and in which at least during the final stage of the transesterification reaction the reaction mixture is submitted to the action of a stripping agent suitable for accelerating the removal of the lower alkyl alcohol formed in said reaction.

The Balint reference (US 3,689,461) discloses a process for the preparation of linear condensation polyesters from a polycarboxylic acid and a polyol which can be carried out in a continuous or discontinuous process. The diagrammatical drawing of the apparatus used in Figure 1 suggests a process whereby the reaction is carried out under plug flow conditions by feeding the output of the initial stage into a series of at least two continuous stirred tank reactors. Example two of the Balint reference, which refers to Figure 1, describes a process whereby part of the partially esterified material which is produced is returned to the inlet of the circulating pump to be combined with fresh paste appears to be within the scope of the backmixing step claimed in the instant application.

Balint et al (US Patent No. 3,679,368), Setzler US Patent No. 3,567,369) and Mansour (US Patent Nos. 4,449,828) all show that the preparation of products in a continuous operation under conditions of backmixing and plug flow is well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Willemse and Volpenhein's process for preparing polyol fatty acid polyesters by applying the various conditions under which the process is to be carried out as suggested by Willemse (EPO) which teaches a transesterification process and the removal of alcohols, Balint '461, Balint et al '368, Setzler and Mansour all of which teach carrying out a process in a continuous operation and under conditions of backmixing and plug flow, since such process steps for preparing polyol polyester and such conditions for the operation of a continuous process increases the quality and quantity of the desired product.

Summary

5. Claims 1, 5, 8, 9, 13-15, 23, 27, 28, 30, 43-45, 48, 51, 54, 55 and 62 are rejected; Claims 63-118 have been requested to be subjected to an Interference under C.F.R. §1.607.

Examiner's Telephone Number, Fax Number, and Other Information

6. For 24 hour access to patent application information 7 days per week, or for filing applications, please visit our website at www.uspto.gov and click on the button "Patent Electronic Business Center" for more information.

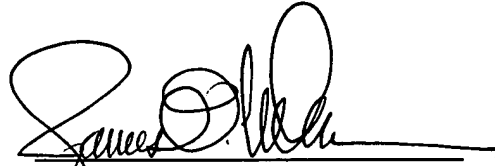
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Everett White whose telephone number is (703) 308-4621. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson, can be reached on (703) 308-4624. The fax phone number for this Group is (703) 308-4556.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1235.

E.White

A handwritten signature in black ink, appearing to read 'James O. Wilson', written over a horizontal line.

James O. Wilson
Supervisory Primary Examiner
Technology Center 1600